

Prior to the first Official Office Action, restriction was required between

- I. Claims 1-11 and 15-20 drawn to a support material; and
- II. Claims 12-14 drawn to a process for the manufacture of a support material.

Pursuant to that restriction requirement the Group I claims 1-11 and 15-20 were elected. Accordingly, the non-elected Group II claims 12-14 were withdrawn from consideration.

In the first Office Action, the Examiner has rejected all of the elected claims as follows:

1. All of the elected claims 1-11 and 15-20 were rejected as indefinite under 35 U.S.C. §112 for the various reasons set forth in Paragraphs 9-16 of the Office Action;
2. Claims 1, 2, 4, 6-9, 11, 15, 16 and 18-20 were rejected under 35 U.S.C. §102(b) as lacking novelty, or in the alternative under 35 U.S.C. §103(a) as obvious, over HASKINS et al. (5,861,209);
3. Claims 6 and 8 were further rejected under §102(b) as lacking novelty over HUSBAND (5,731,034);

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second claim 9 was renumbered "10" and all of the subsequent claim numbers were changed accordingly. Thus, claims 1-20 were originally pending in the application.

4. Claims 1-11 and 15-20 were rejected under 35 U.S.C. §103(a) as being obvious over HUSBAND; and
5. Claims 1, 3, 15 and 17 were rejected under 35 U.S.C. §102(b) as lacking novelty, or in the alternative under 35 U.S.C. §103(a) as obvious, over FORBUS et al. (5,624,488).

The several rejections of the claims under §112 will be first addressed.

As to the §112 rejection in paragraph 9 of the Office Action directed to the words "containing" and/or "contains" in claims 1, 3, 6, 10, 15 and 17, it is respectfully submitted that these words fully comply with §112 and do have accepted meaning. Indeed, MPEP §2111.03 is specifically cited in the Office Action as supporting the §112 rejection of the claims on this ground. However, to the contrary, that section of the MPEP specifically states that the phrase "containing" is quite acceptable. It expressly equates both "containing" with "comprises" stating

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps (citations omitted).

It is also respectfully submitted that the phrases "less than about", "at least about" and "a maximum of about" found in claims

1, 3-5, 8-11, 15, 17 and 18 and rejected in paragraph 10 of the Office Action also fully comply with §112. In this regard specific reference is made to MPEP §2173.05(b)A which expressly condones the use of "about".

As to the objection to the preamble of claims 1 and 6 in paragraph 11 of the Office Action, it is believed that the claims as presently amended obviate this rejection.

As to the rejection in paragraph 12 of the Office Action of the phrase "narrow grain distribution" under §112 on the ground that one skilled in the art would not be able to determine exactly what constitutes "narrow", it is respectfully submitted that the specification and indeed the claims are quite explicit in this regard. Specifically, page 3, line 5-page 4, line 7, as well as claims 1 and 15, expressly define what a "narrow grain distribution" should mean. For example, claim 1 specifically spells out that a narrow grain distribution is

whereby at least about 70% by weight of these pigment particles feature a size of less than about  $1\mu\text{m}$  and at least 40% by weight of these particles feature a grain size 0.35 to  $0.8\mu\text{m}$ .

As to the rejection of claims 1 and 15 in paragraph 13 of the Office Action directed to the "70% of the pigment particles" claims 1 and 15 have been amended to specifically set forth that it is "70% by weight". This is clearly supported in the specification at page 4, line 2. Further it is believed that the claims clearly indicate what the percentage is based on because the claims state that it is "70% by weight of the pigment particles".

As to the rejection of claim 5 in paragraph 14 of the Office Action, it is respectfully submitted that the claim itself defines what the "slightly compressed paper" is when it continues on stating that it is a paper "with a density of less than about 1g/cm<sup>3</sup>. [ ]

As to the rejection of claims 6 and 19 in paragraph 15 of the Office Action regarding the "structured" calcium carbonate, the subject matter of claim 7 has been incorporated into claim 6 which specifically sets forth that the calcium carbonate has a surface modified by an inorganic substance in platelet shape, and claim 19 has been canceled. Thus, these amendments should obviate the objection to the term "structured". As to the objection to claims 7 and 20 for failing to clearly indicate how the calcium carbonate is modified by an inorganic substance in platelet shape, it is respectfully submitted that this language is clear to a skilled person in the art. It is the general knowledge of those skilled in the art that surface modification is a coating of the pigment with further pigments. Accordingly, it is respectfully submitted that the rejection of claims 7 and 19 which have now been canceled and claim 20 should be reconsidered and withdrawn.

Finally, a §112 rejection is stated in paragraph 16 of the Office Action of claims 8 and 9 on the ground that the recitation of the amount of pigment of at least 5% by weight is unclear because the "claims do not specify exactly what type of pigment in the total amount of pigments amounts to" that amount. Claim 9 has now been canceled as redundant and claim 8 has been amended to specifically set forth that at least 5% by weight is the surface modified calcium carbonate set forth in parent claim 6.

Accordingly, it is believed that all of the §112 rejections have been overcome and any rejection of the claims under §112 should be obviated.

The present invention is directed to a resin coated support material which is formed by coating the raw paper with a pigment layer in which at least 70% by weight of the pigment is particles of less than  $1\mu\text{m}$ , and at least 40% by weight is a particle size of 0.35-0.8  $\mu\text{m}$ . The pigment layer is coated on the raw paper and the resin coating is applied to the pigment layer.

An important feature of the present invention is the coverage of the raw paper with a selected pigment mixture and the coating of the pigment coated raw paper with the polyolefin resin. This achieves a savings in the amount that is needed of the expensive polyolefin. Moreover, it was surprisingly found that the pit level in the polyolefin layer is reduced by proceeding according to the invention. This is shown in table 3 of the application.

The particle size distribution as set forth in claims 1 and 15 is very narrow. This is important to obtain good coverage of the raw paper. This size distribution is such that at least 70% of the pigment particles have a particle size of less than  $1\mu\text{m}$ . It is also important that the pigment coating is not too smooth otherwise the adherence of the polyolefin layer would be poor.

Where the support paper is a photographic support material, the polyolefin resin is also an important structural feature of the subject matter of the present application. Without the polyolefin coating the developer liquid in the subsequent developing of the image would penetrate into the paper and would adversely affect the image quality. For the skilled person it was not clear whether the

polyolefin resin would adhere without problems on the pigment coated paper.

None of the prior art relied upon in the rejection of the claims recognizes or suggests the coating of a polyolefin resin either having the particle size distribution of the present invention or otherwise on a pigment layer. Moreover, none of the prior art discloses a polyolefin coating on a pigment layer for the purpose of the present invention, e.g. conservation in amount of polyolefin and/or reduction in pit level, or any other purpose. All of the independent claims 1, 6 and 15 as presently amended include the combination of a pigment layer on the raw paper and a polyolefin layer on the pigment layer.

HASKINS et al. disclose a paper coated with a pigment for rotogravure printing. They have found that the use an argonitic precipitated calcium carbonate having a bimodal particle size distribution improves the missing dot performance in rotogravure printings as well as the ink absorption. HASKINS et al. has no disclosure or suggestion to apply a polyolefin coating on the pigment layer.

In column 4, lines 3 to 33 particle size distribution of the pigments of HASKINS et al. is discussed. This distribution is wider than that of the present invention. In the drawings of HASKINS et al. typical bimodal particle size distributions are shown. This means HASKINS et al. use two pigments which differ from each other in the grinding, i.e. by the particle size distribution. Proceeding that way enables a high package density of the pigment particle. Thus, this is another way to obtain a good coverage.

However, HASKINS et al. neither disclose or suggest a narrow particle size distribution as in the present invention nor a polyolefin coating on the pigment layer. Moreover, the pigment of the present invention does not discuss a bi or multimodal particle size distribution. HASKINS et al. are interested in obtaining a high opacity. This is not the intention of the pigment coating of the present invention, and such opacity is not achieved by the present claimed invention.

HUSBAND discloses a paper coating composition comprising an aqueous cationic dispersion of a particulate calcium carbonate pigment and a non-ionic or cationic adhesive. According to column 5, lines 5 to 9, the adhesive has the function of a binder. The paper coated according to HUSBAND can be used for a wide range of applications such as offset lithography, offset printing and gravure printing (col. 5, lines 4-9). None of the paper used for those printing purposes requires a polyolefin coating as set forth in the present claimed invention. Thus, HUSBAND contains no teaching or suggestion of such a polyolefin layer.

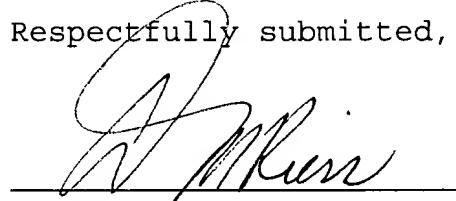
Moreover, according to HUSBAND no more than 1% of the pigment particles have a particle size of larger than 10 $\mu\text{m}$ , at least 65% by weight of the pigment particles have a particle size smaller than 2 $\mu\text{m}$ , and not more than 10% by weight have a particle diameter smaller than 0.25 $\mu\text{m}$  (col. 2, lines 1-8). Thus, the particle size distribution of HUSBAND is not as narrow as set forth in the present claimed invention.

FORBUS et al. is directed to the manufacture of calcined, low abrasion, high brightness kaolin clay pigments and the use thereof in paper manufacture. FORBUS et al. primarily deals with the

manufacture of such pigments. FORBUS et al. defines the particle size of the pigment resulting from the process to be about 75%, preferably 80 to 87%, finer than  $1\mu\text{m}$ . This is a narrow particle size distribution. However, FORBUS et al. is silent on the use of a polyolefin coating on a pigment coated paper.

For the above reasons, it is respectfully submitted that all of the remaining elected claims in the present application, claims 1-6, 8, 10, 11, 15-18 and 20-23, are in condition for allowance. Accordingly, favorable reconsideration and allowance are requested.

Respectfully submitted,



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VERSION WITH MARKED-UP COPY

In the Specification:

On page 10, line 4, amend the title to read as follows --  
Comparison example V1--.

On page 10, line 9, amend the title to read as follows --  
Comparison example V2--.

On page 10, line 18, amend the title to read as follows --  
Comparison example V3--.

On page 10, line 24, amend the title to read as follows --  
Comparison example V4--.

In the Claims:

Amend the claims 1, 6, 8 and 15 to read as follows:

1. (Thrice Amended) Support material coated on at least one side with a synthetic resin, containing a raw paper provided at least on the front side with a pigment coating, wherein the synthetic resin is a polyolefin resin ~~on the pigment coating~~, and wherein the pigment coating contains at least about 5% by weight of a pigment having particles with a narrow grain distribution with respect to the weight of the total pigment in the pigment layer, whereby at least about 70% by weight of the pigment particles have a size of less than about 1 $\mu$ m and at least 40% by weight of the particles have a grain size of 0.35 to 0.8 $\mu$ m.

6. (Once Amended) Support material coated on at least one side with synthetic resin, containing a raw paper provided on at least the front side with a pigment coating, wherein the synthetic resin

is a polyolefin resin on the pigment coating, and wherein the pigment coating contains [a structured] calcium carbonate which has a surface modified by an inorganic substance in platelet shape.

8. (Once Amended) Support material according to claim 6, wherein the proportion of the surface modified calcium carbonate pigment in the total amount of pigment amounts to at least about 5% by weight.

15. (Thrice Amended) Support material for an ink-jet recording sheet comprising a raw paper provided at least on the front side with a pigment coating, wherein the synthetic resin is a polyolefin resin on the pigment coating, and wherein the pigment coating contains at least about 5% by weight of a pigment having particles with a narrow grain distribution with respect to the weight of the total pigment in the pigment layer, whereby at least about 70% by weight of the pigment particles have a size of less than about  $1\mu\text{m}$  and at least 40% by weight of the particles have a grain size of 0.35 to  $0.8\mu\text{m}$ .